

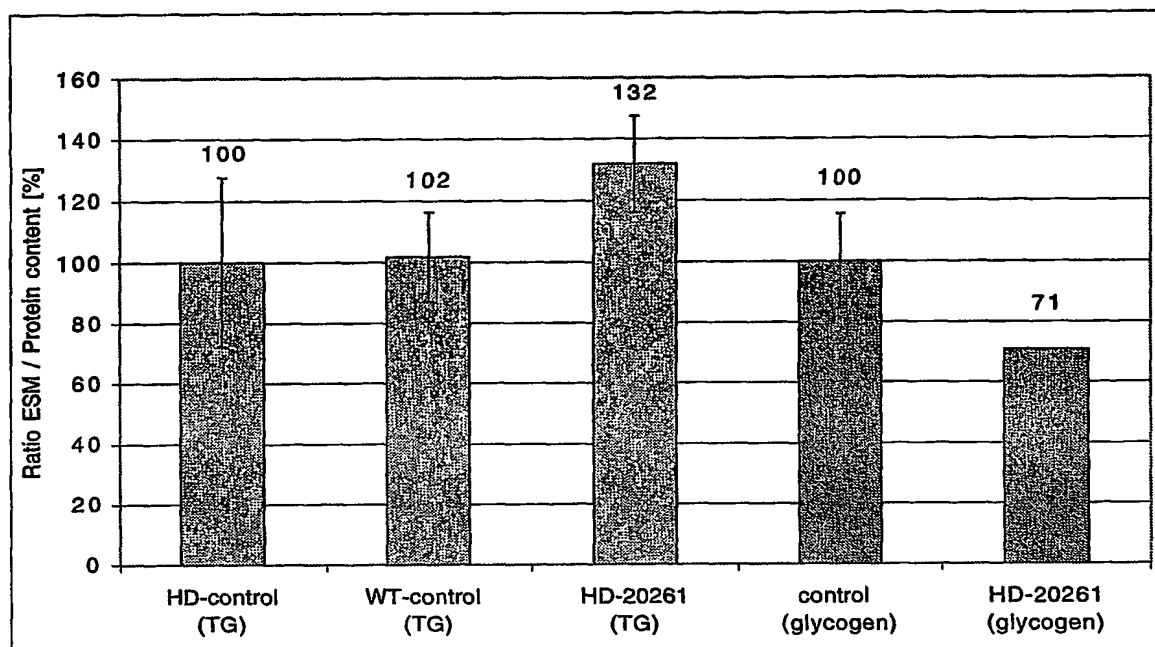
Figure 1. Energy storage metabolite content of a *Drosophila PRL-1* mutant

Figure 2. Molecular organization of the *PRL-1* gene (GadFly Accession Number CG4993)

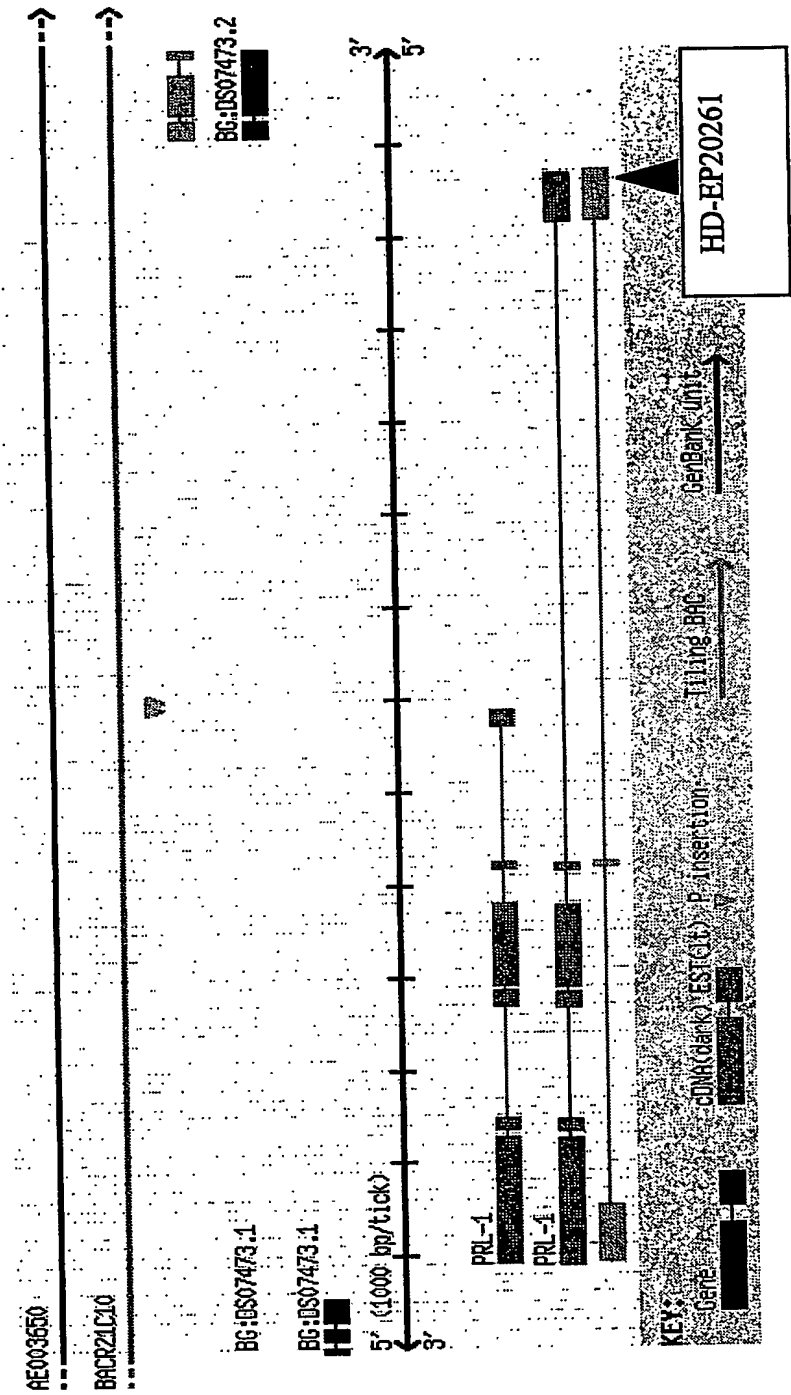


Figure 3. Nucleic acid sequences encoding the human proteins of the invention and amino acid sequences of the proteins of the invention

Figure 3A. Homo sapiens protein tyrosine phosphatase type IVA, member 1 (Prl-1), Nucleic acid sequence (SEQ ID NO: 1)

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1  ccggctcggt  acgcgctctg  ctccgagccg  ctcaactgct  ggtagagtct  ggtgcccccg
61  ccgtcgccctg  catcgccgcc  accgcccgtc  cgccacgacc  accgcccgtc  cctgccctgc
121  agccaccgcc  accgcctgtg  tcgccgccgc  ctccggaccg  gctgtatgat  taggccacaa
181  tcttcaatga  gtaaacatat  tcctcaattc  tgtgggtgtc  ttggtcacac  atttatggag
241  tttctgaagg  gcagtggaga  ttactgccag  gcacagcacg  acctctatgc  agacaagtga
301  actgtagaaa  ctgattactg  ctccaccaag  aagcccccat  aagagtgggt  atcctggaca
361  cagaagtgtt  gaattgaaat  ccacagagca  ttttacaaga  gttctgacct  ggatggggta
421  aacctcagtg  cacttctttt  ctggtggcct  cagtattact  ggattgaaga  attgctgctt
481  cttgtagga  ggttcatttc  acttatcatt  acttacaact  tcatactcaa  agcactgaga
541  atttcaagt  gagtatattg  aagtagactt  cagtttcttt  gcatcatttc  tgtattcaat
601  ttttttaatt  atttcataac  cctattgagt  gttttttaac  taaattaaca  tggctcgaat
661  gaaccgcca  gctcctgtgg  aagtcacata  caagaacatg  agatttctta  ttacacacaa
721  tccaaccaat  gcgaccttaa  acaaatttat  agaggaactt  aagaagtatg  gagttaccac
781  aatagtaaga  gtatgtgaag  caacttatga  cactactctt  gtggagaaag  aaggtatcca
841  tgttcttgat  tggccttttg  atgatgggtc  accaccatcc  aaccagattg  ttgatgactg
901  gttaagtctt  gtgaaaatta  agtttcgtga  agaacctggt  tgttgatttg  ctgttcattg
961  cgttgcaggg  cttgggagag  ctccagtact  tgttgcccta  gcattaattg  aaggtggaat
1021  gaaatacgaa  gatgcagtac  aattcataag  acaaaagcgg  cgtggagctt  ttaacagcaa
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1141  cggtcataga  aacaactgtt  gcattcaata  aaattggggt  gcctaattgt  actggaagtg
1201  gaacttgaga  tagggcctaa  tttgtttata  atattagcca  acatgttggc  ttagtaagtc
1261  taatgaagct  tccataggag  tattgaaagg  cagttttacc  aggcctcaag  ctagacagat
1321  ttggcaacct  ctgtatttgg  gttacagtca  acctatttgg  atacttggca  aaagattcct
1381  gctgtcagca  tataaaatgt  gcttgtcatt  tgtatcaatt  gacctttccc  caaattcatg
1441  agtattgagt  tatgacttgt  taaattctat  cccatgccag  aatcttatca  atacataaga
1501  aatttaggaa  gattaggtgc  caaaatcccc  agcacaatac  ttgtatattt  ttagtaccat
1561  acagaagtaa  aatcccagga  actatgaaca  ctagacctta  tgtggtttat  tccttcaatc
1621  atttcaaaaa  ttgaaagtag  ggcctacatg  gttatttggc  tgctcacttt  atgtttacat
1681  ctccacatt  cataccaata  tacgtcaggt  ttgcttaacc  attgattttt  tttttttttt
1741  accaagtctt  acagtgatta  ttttacgtgt  ttccatgtat  ctcaacttgt  gctgtattaa
1801  aaaaacctcc  attttgaaaa  tctacgttgt  acagaagcac  atgtctttaa  tgtcttcaga
1861  caaaaaagcc  ttacattaat  ttaattgttg  cactctgagg  tgcaacttaa  caggtagggc
1921  ctgagaaaag  aatgggaggg  ggctattaat  tattttttag  caaaatgttg  cctttgtcct
1981  gtgcaaacat  gtagaatatg  ctctttaatt  tagtaaaata  ttttttttaa  aggtagagat
2041  gctttgttat  tgtaatcata  aacttcctga  aattcttgta  atttttttcc  catacttatc
2101  agaagtgtgt  ttaccaactt  atttttgttt  gaaagtgtga  tttttttttt  ccttcccaac
2161  ctctcttgca  aaaaaagaaa  tgggtttctg  ctaatgaatt  gagcacatct  aatattttat
2221  atgccttttg  gagctgtgta  agttaatat  tgatacttga  caatttgttt  tattatgtaa
2281  ttgataaaat  ggtgatgtgt  attaatgtta  gttcaaccat  atatttatat  tgcctgggga
2341  tgtgtgggta  tagttctgtg  ggagaaataa  ttttgtcagt  gttcaccagc  ttgtaaaaaa
2401  ttagtgcgag  agctgaaaca  tctaaataaa  taatgacatg  catttatcat  cattgagatt
2461  ggtttgtctt  aaattaactt  attttgtaga  agacaaaatg  aattgcactt  cacttaattg
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2641  ttatatactt  tttaaagggt  tagataattt  tgaaccaatt  tattattgtg  tactgaggag
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2761  tttgtgcaac  ttctgagcct  cagttttctc  ctttgcaaat  taataattac  atacctttat
2821  agattttgaa  attaatttta  atattagtat  ttggtacatg  aaggcttaat  gtttaagttc
2881  ctttaattgat  ccacaataat  ccctttgatc  acgttaatct  aaatctagat  gtctttgtct
2941  aatttttttt  gaatagcagt  tataaatgta  aaggactcaa  agtttaagta  aaaagtgata
3001  ctccaccttg  tgtttcaaa  aatttagttc  cacctcttca  taccagttta  acacttaata

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3061 tattttcattg gatttttagac agggcaaaaag gaagaacagg ggcctctgga ggcccttggt
3121 tattttaaadc ttggattatt tgtgatagta atcacaaatt tttggctaata ttttaacctg
3181 aggttttggtt ttttttttaa aggaaatgca gcctagtctt gagaacataa ttttatataa
3241 tcaattacta aatgttaaac tattaccaca cagcccataa aacagcattt gcgtttattg
3301 agagagagga tgtgccatca tgattaatga aaactatctt ttgagtttga aaagaaatta
3361 atttgcagtg tttggattgt atatatgggtg ctaaaaataa attaatttac tttataaacc
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3601 atttggttac ttgggtttgg atacccttag tgggatgatg taaatagagg ctagctacct
3661 aggccttgct atagcaacca taatgttgat gtaagtaatg cggttactga atcataagaa
3721 aatgccatct ctttttagtt gaaggaaaac tctggaagta ggtgccattg gtcattctgc
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3841 ttcccacgcc ttaacacagc tctataccta gaagcagcca gcccaggcat gcagtcacat
3901 ttaatcacat cccccttcta gagtgttcca aaatgatgta gtccctcaac ttggctaaag
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4081 caccaatgag tacccgaccc gttgccatga ttaagagaga atgctttcta ttggagtttc
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4201 cttttacatg taaacaatga agttatttca aagttaagtt ttaaacaaaa tacatgaagt
4261 agtgtctgcc atacatgtta atattctaca ttcttgcttc cttaaattaa tatgtttgtg
4321 tgtatatatg tgcctcacac ctgaattgaa aattaaagac tggtttaaaa gtggttaaaa
4381 aaaaaaaaaa aaaa

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Figure 3B. Homo sapiens protein tyrosine phosphatase type IVA, member 1 (Prl-1), Amino acid sequence (SEQ ID NO: 2)

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1 marmnrpapv evtyknmrfl ithnptnatl nkfielkky gvttivrvce atydttlvek
61 egihvldwpf dddgappsni vddwlslvki kfreepgcci avhcvaglgr apvlvalali
121 eggmkyedav qfirqkrrga fnskqllyle kyrpkmlrlf kdsnghrnnc ciq

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Figure 3C. Homo sapiens protein tyrosine phosphatase type IVA, member 2 (Prl-2), Nucleic acid sequence, transcript variant 1 (SEQ ID NO: 3)

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1 agcgggggctg cgcgaagtca tcgctgttcc agacagcgat gactcgagag cgggtgggggt
61 ggcggcgcgca tcggccgggc tgtaaccgtc gtctgtccgg gagcggtgg agcggcagcg
121 gcggccgggc acggcgcgag gtgacgccac agggcagcgg cggcagcgga ggcagcgcg
181 gcagcaggag acgcagcggc ggccgcagca gcagcagcaa gacggactcg tggagacgcg
241 ccgcccgcgc cgcgcgggg cggggccggg tgtcgcgcgc cgaggctggg ggggagtcgt
301 cgccgcgcgc gccaccgcta ccgcccgcgc cgcgcgcgcc gaggtgactg aggagagagg
361 cgcctcctcg ctcccgccac cgcgggactt caatgcccag tcccagctc gccagcggtt
421 ttcgttgga tatacgttgc acatttatgg cgattctgag tgtgagggca gacttctgcc
481 aggctcagca cagcattttc gctgacaagt gagcttggag gttctatgtg ccataattaa
541 cattgccttg aagactcctg gacaccgaga ctggcctcag aaatagttgg cttttttttt
601 tttttaattg caagcatatt tcttttaaat actccagtaa aattaagcat caagtaaaca
661 agtggaagt gacctacact ttttaactgt ctactagtg cctaaatgta gtaaaggctg
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901 agtgggtctt ttaatgtttt ctgctgtgaa acatttcaag atttattgat tttttttttt
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1021 cagccctctg ggagatctcc tatgagaaca tgcgttttct gataactcac aaccctacca
1081 atgctactct caacaagttc acagaggaac ttaagaagta tggagtgcgc actttgggtc
1141 gagtttgtga tgctacatat gataaagctc cagttgaaaa agaaggaaac cacgttctag
1201 attggccatt tgatgatgga gctccacccc ctaatcagat agtagatgat tggttaaacc

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1261 tgttaaaaac caaatctcgt gaagagccag gttgctgtgt tgcagtgcac tgtgttgacg
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1621 attcagtact cctcaaccac tctcctaata attggaacaa aagcaaacaa aaaagaaatc
1681 tctctataaa atgaataaaa tgtttaagaa aagagaaaga gaaaaggaaat taattcagtg
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2221 caaaacccta tctaatacta ggcaaagtag ccaagagcct tttgttttgt tttattttg
2281 ataaattagt ggagaaatgg cattttaaga ggagtctctt ctcaacttac ctgagagtcg
2341 aattcttctc ttcctaacc aatgaagcta agtggttatc ccagaaactt gtcttctaaa
2401 agggaggact ccaggccatc aataaagatg tccaggcagt gagcgtactt tttacaccct
2461 gtagaattgt gggctgtagc gttactctga ttttctgtct agtatcagag aatgctggta
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2581 cagcaaatct acatatcttc gacttgagaa atgcttggtg tattactagg ttttttgaga
2641 ccctatatgt aaagttcagt ttaaccactg attgccttgt cctagttagt atgtgtccac
2701 ttaaaaaaaa aaaatccctg gttttaaacc agagacatcg tgcaacccaa tgagttagtg agggactgtg
2761 aggcataaac agggtagaag tagcattttt gcagattctt ggctgggttt agtgtagtga
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3241 cctctcccat ccagaaaaac aaattcttta tttcagaatg caacaataga ttccattaat
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3781 atttgaaagg tgtgcagcct gattttaaac caaacctga acccttttaa agaacaataa
3841 aacatatctt acacgctcaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa
3901 aaaaaaaaaa aaaaaaaaaa aaaaaa

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Figure 3D. Homo sapiens protein tyrosine phosphatase type IVA, member 2 (Prl-2), Amino acid sequence transcript variant 1 (SEQ ID NO: 4)

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1 mnrpapveis yenmrflith nptnatlnkf teelkkygvt tlrvvcdaty dkapvekegi
61 hvldwfpddg appnqivdd wlnllktkfr eepgccvavh cvaglggrapv lvalaliecg
121 mkyedavqfi rqrkgafns kqllylekyr pkmlrlfrdt nghccvq

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Figure 3E. Homo sapiens protein tyrosine phosphatase type IVA, member 2 (Prl-2), Nucleic acid sequence, transcript variant 2 (SEQ ID NO: 5)

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1 agcgggggctg cgcgaagtca tcgctgttcc agacagcgat gactcgagag cgggtgggggt
61 ggcgggcgcga tcggccgggc tgtaaccgtc gtctgtccgg gagcggctgg agcggcagcg
121 gcgcccgggc acggcgcgag gtgacgccac agggcagcgg cggcagcgga ggcagcgggc
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421 ttcgttgga tatacgttgc acatttatgg cgattctgag tgtgagggca gacttctgcc
481 aggtcagca cagcattttc gctgacaagt gagcttgagg gttctatgtg ccataattaa
541 cattgccttg aagactcctg gacaccgaga ctggcctcag aaatagttgg cttttttttt
601 tttttaattg caagcataatt tcttttaatt actccagtaa aattaagcat caagtaaaca
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841 aagcttcata aggaataaac aagttgaata gagaaaacac tgattgataa taggcatttt
901 agtgggtctt ttaatgtttt ctgctgtgaa acatttcaag atttattgat tttttttttt
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1021 cagccctgtg ggagatctcc tatgagaaca tgcgttttct gataactcac aaccctacca
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1801 aatctcctgt ctttttaaac tttttcaaaa taggtctcta aggaaaacca gcagaacatt
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1921 tgggattttt ttcccttttt ttgtggggga ggggtgggtg tatatttttc cctctttttt
1981 tccttcctct cctacatctc ccttttcccc cgatccaagt ttagatgga atagaagccc
2041 ttgttgctgt agatgtgcgt gcagtctggc agccttaagc ccac

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Figure 3F. Homo sapiens protein tyrosine phosphatase type IVA, member 2 (Prl-2), Amino acid sequence transcript variant 2 (SEQ ID NO: 6)

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1 mnrapveis yenmrflith nptnatlnkf teelkkygvt tlrvvcdaty dkapvekegi
61 hvldwfpddg apppnqivdd wlnllktkfr eepgccvavh cvaglgrapv lvalaliecg
121 mkyedavqfi rqkrrgafns kqllylekyr pkmlrlfrdt nghccvq

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Figure 3G. Homo sapiens protein tyrosine phosphatase type IVA, member 2 (Prl-2), Nucleic acid sequence, transcript variant 3 (SEQ ID NO: 7)

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1 agcgggggctg cgcgaagtca tcgctgttcc agacagcgat gactcgagag cgggtgggggt
61 ggcgggcgcga tcggccgggc tgtaaccgtc gtctgtccgg gagcggctgg agcggcagcg
121 gcgcccgggc acggcgcgag gtgacgccac agggcagcgg cggcagcgga ggcagcgggc
181 gcagcaggag acgcagcggc ggccgcagca gcagcagcaa gacggactcg tggagacgcg

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241 ccgccgccgc cgccgccggg ccggggccggg tgtcgcgcgc cgaggctggg ggggagtcgt
301 cgccgccgcc gccaccgcta ccgccgccgc cgccgccgcc gaggtgactg aggagagagg
361 cgccctctcg ctcccgccac cgccggactt caatgccag tcccagctc gccagcgttt
421 ttcgttgga tatacgttgc acatttatgg cgattctgag tgtgagggca gacttctgcc
481 aggctcagca cagcattttc gctgacaagt gagcttggag gttctatgtg ccataattaa
541 cattgccttg aagactcctg gacaccgaga ctggcctcag aaatagttgg cttttttttt
601 tttttaattg caagcatatt tcttttaatg actccagtaa aattaagcat caagtaaaca
661 agtggaaagt gacctacact ttttaacttg ctcactagtg cctaaatgta gtaaaggctg
721 cttaagtttt gtatgtagtt ggattttttg gaggccgaat atttccatct gcagaaattg
781 agggccaaat tgaatttgga ttcaagtgga ttctaaatac tttgcttatc ttgaagagag
841 aagcttcata aggaataaac aagtgtgaata gagaaaacac tgattgataa taggcatttt
901 agtgggtctt ttaatgtttt ctgctgtgaa acatttcaag atttattgat tttttttttt
961 cactttcccc atcacactca cacgcacgct cacacttttt atttgccata atgaaccgtc
1021 cagccctgtt ggagatctcc tatgagaaca tgcgttttct gataactcac aaccctacca
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1201 aaaagaaggg gagcgttcaa ttccaaacag ctgctttatt tggagaaata ccgacctaa
1261 atgcgattac gcttcagaga taccaatggg cattgctgtg ttcagtagaa ggaaatgtaa
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1381 tggaaatatta cctgtgtcat caaagtagtg atggattcag tactcctcaa ccactctcct
1441 aatgattgga acaaaagcaa acaaaaaaga aatctctcta taaaatgaat aaaatgttta
1501 agaaaagaga aagagaaaag gaattaattc agtgaaggat gattttgtct ctagttttgg
1561 agtttgaatt tctgccagga ttgaattatt ttgaaatctc ctgtcttttt aaactttttc
1621 aaaataggtc tctaaggaaa accagcagaa cattaggcct gtgcaaaacc atctgtttgg
1681 ggagcacact ctt

```

Figure 3H. Homo sapiens protein tyrosine phosphatase type IVA, member 2 (Prl-2), Amino acid sequence, transcript variant 3 (SEQ ID NO: 8)

```

1 mnrapveis yenmrflith nptnatlnkf teelkkygvt tlvrvcdaty dkapvekegi
61 hvlkkkgsvq fqtaalfgei pt

```

Figure 3I. Homo sapiens protein tyrosine phosphatase type IVA, member 3 (Prl-3), Nucleic acid sequence (SEQ ID NO: 9)

```

1 tgactatcca gctctgagag acgggagttt ggagttgccc gctttacttt ggttgggttg
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421 gctcagcacc ttcataggag acctgaagaa gtacggggct accactgtgg tgcgtgtgtg
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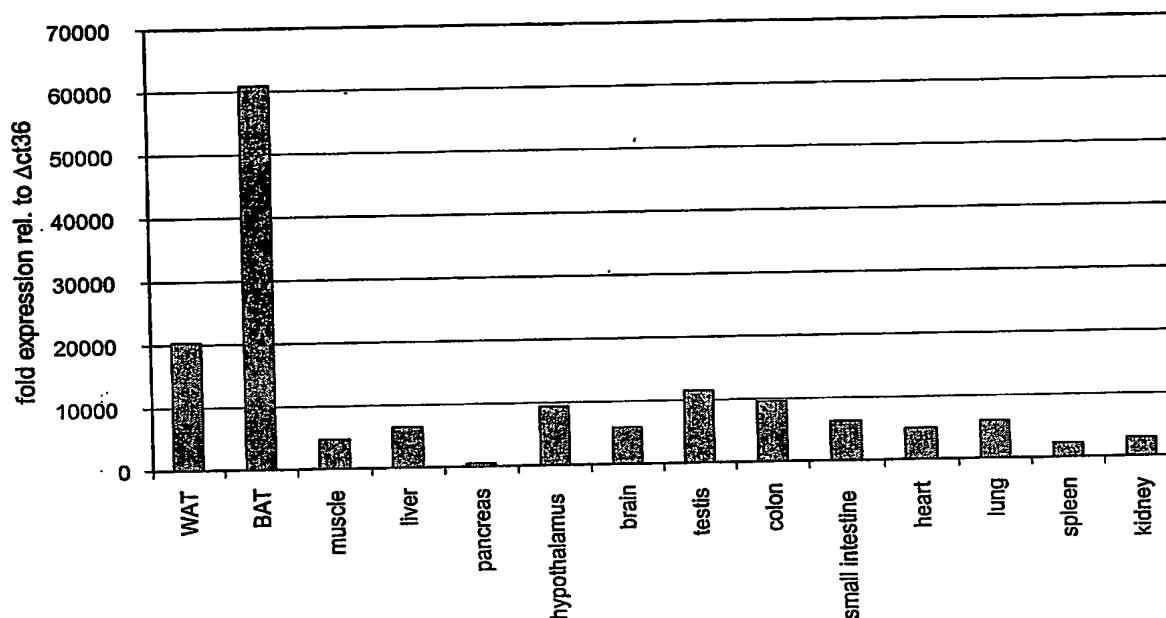
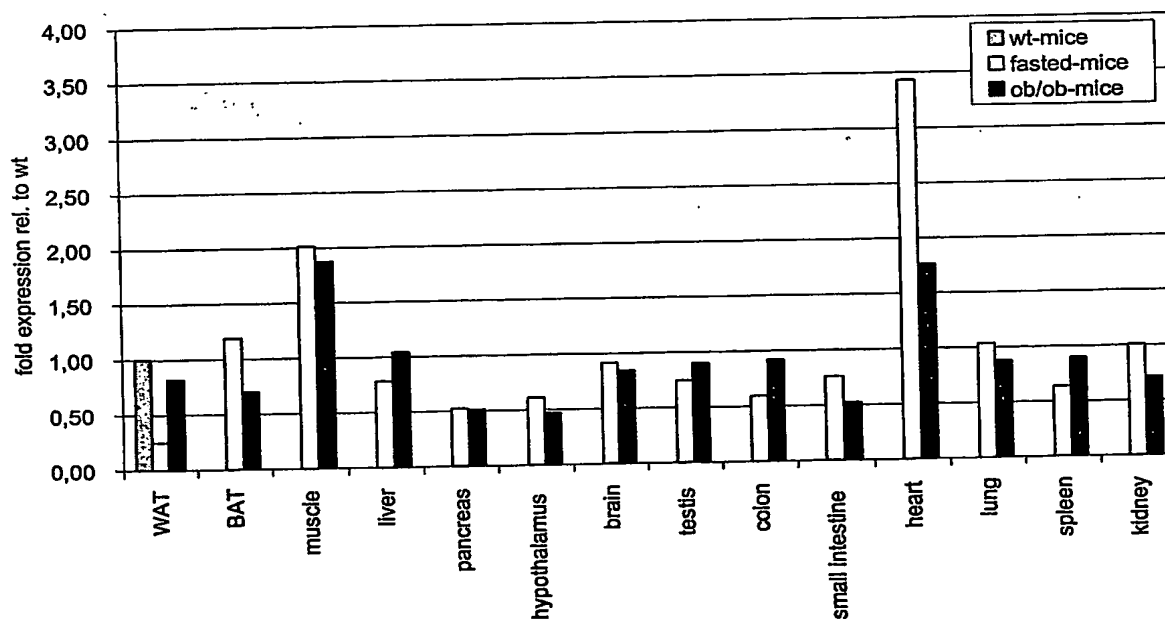
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1261 gcaccttaaa ttattagacc cgggggcagt caggtgctcc ggacacccga aggcaataaa
1321 acaggagccg tgaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa
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**Figure 3J. Homo sapiens protein tyrosine phosphatase type IVA, member 3 (Prl-3),
Amino acid sequence (SEQ ID NO: 10)**

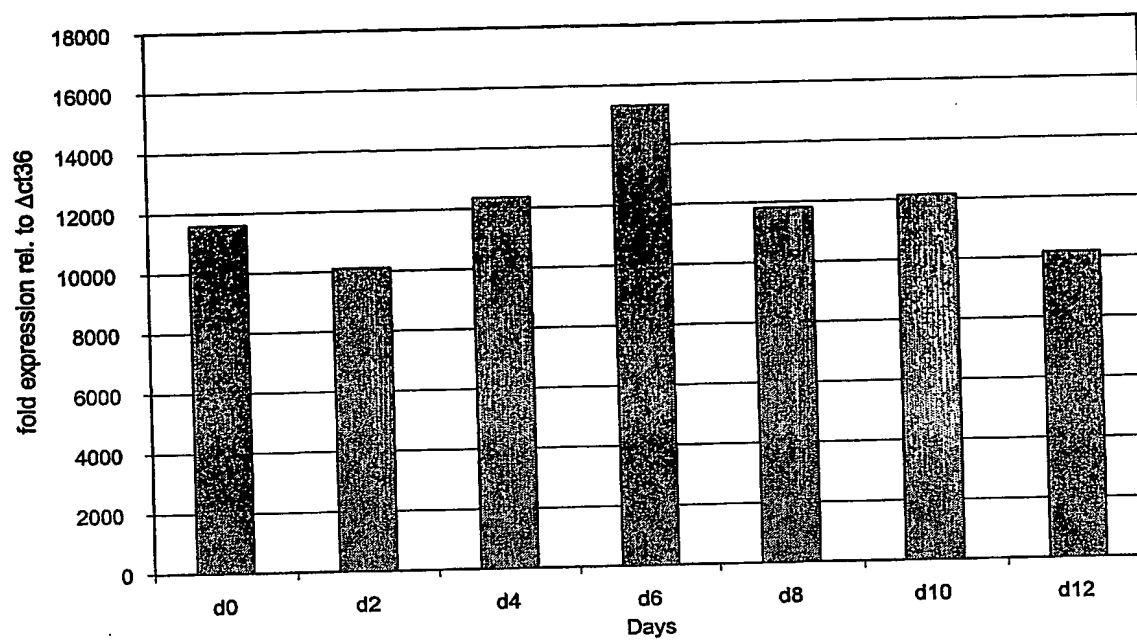
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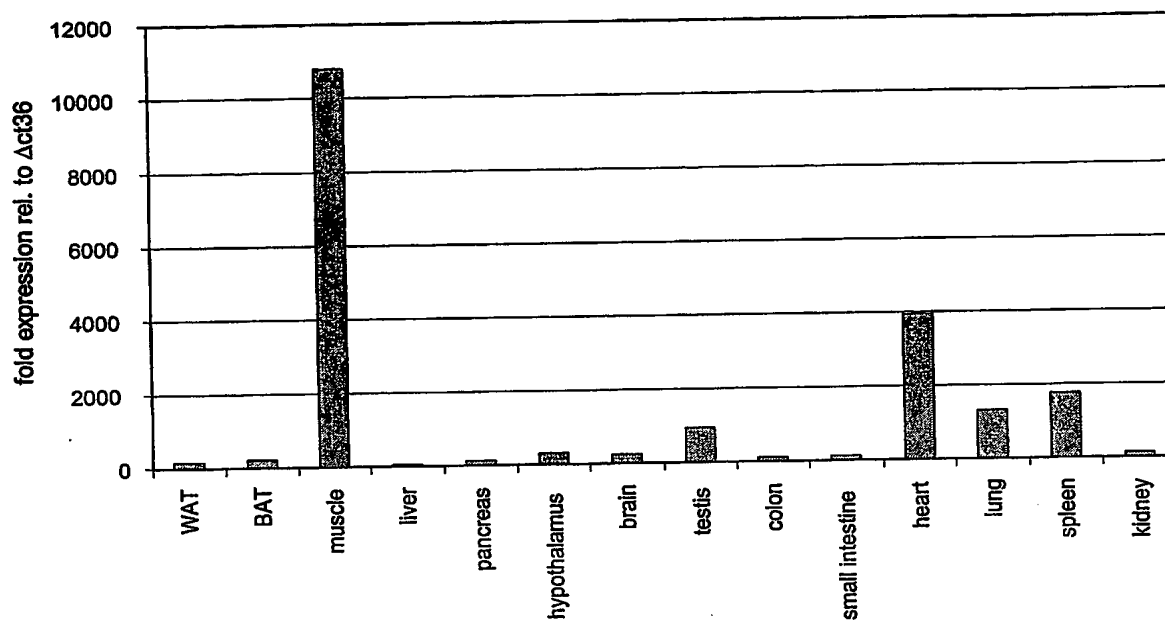
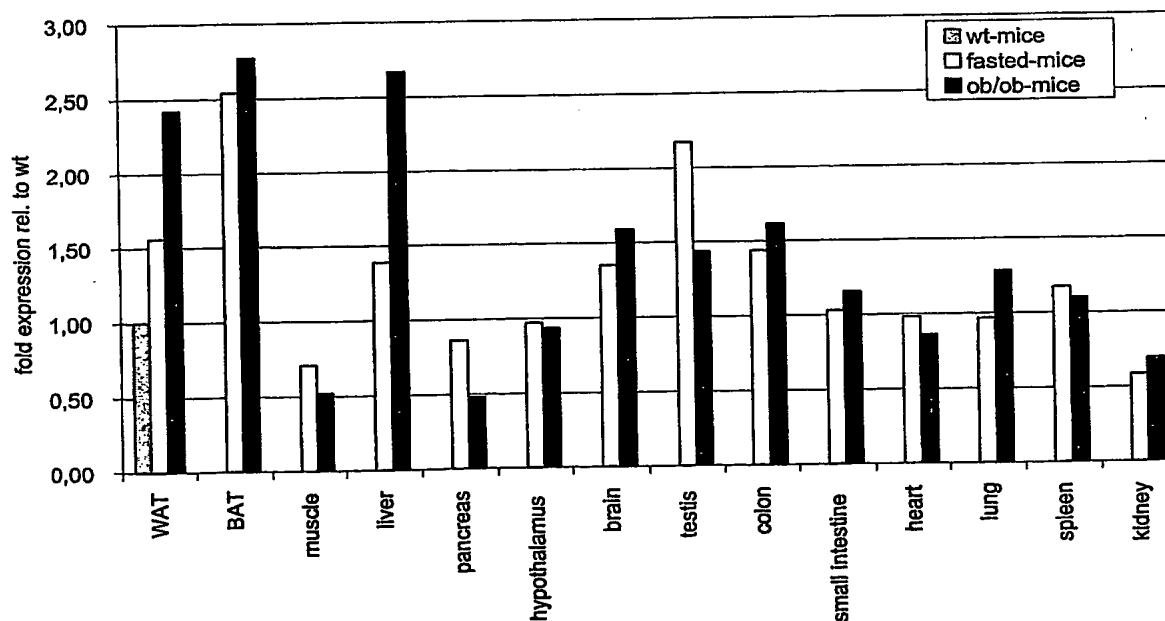
Figure 4. Expression of Prl-1 in different mammalian models**Figure 4A. Real-time PCR analysis of Prl-1 expression in wild type mouse tissues****Figure 4B. Real-time PCR analysis of Prl-1 expression in different mouse models**

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Figure 4C. Real-time PCR analysis of Prl-1 expression in adipocytes during differentiation of 3T3-L1 cells from preadipocytes to mature adipocytes



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Figure 4D. Real-time PCR analysis of Prl-3 expression in wild type mouse tissues**Figure 4E. Real-time PCR analysis of Prl-3 expression in different mouse models**

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Figure 4F. Real-time PCR analysis of Prl-3 expression in wild type mice fed a high fat diet compared to mice fed a control diet

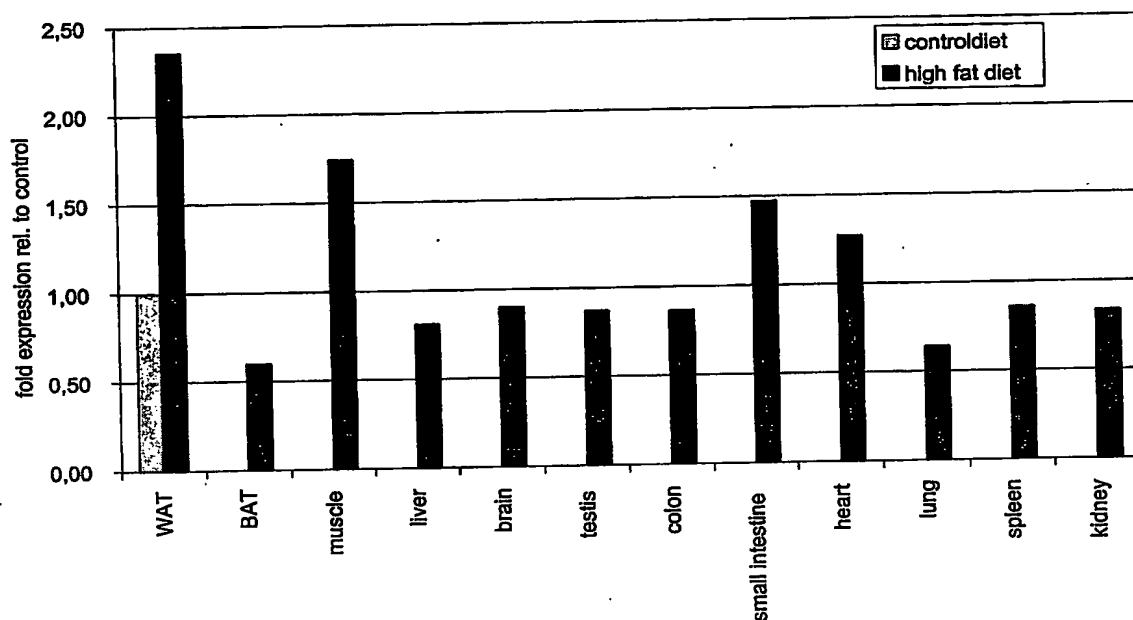


Figure 4G. Real-time PCR analysis of Prl-3 expression in adipocytes during differentiation of 3T3-L1 cells from preadipocytes to mature adipocytes

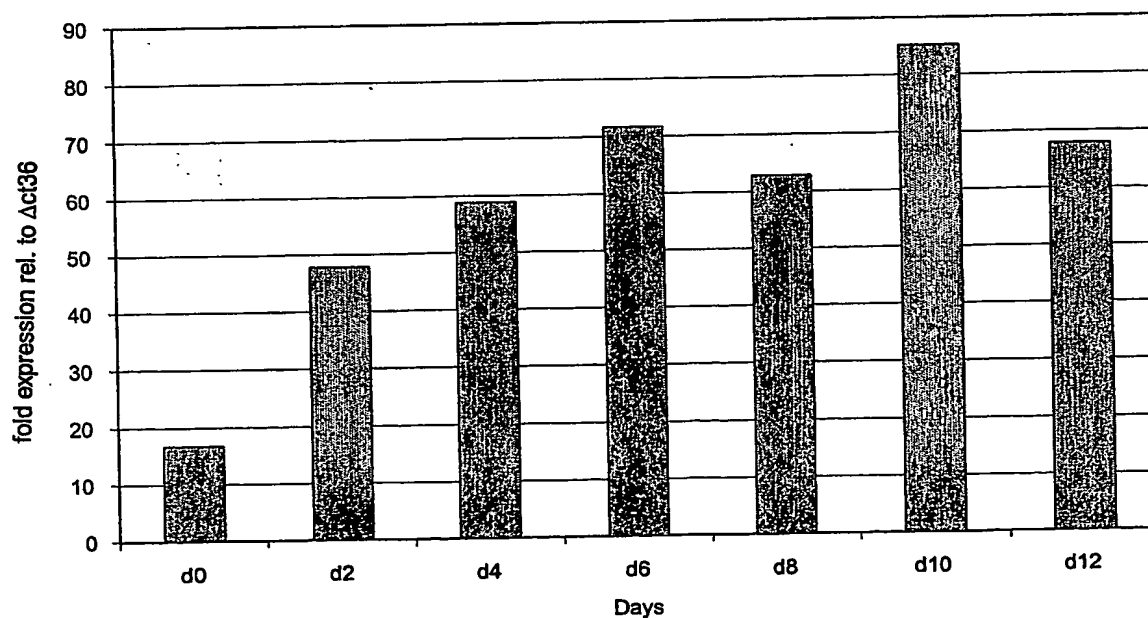
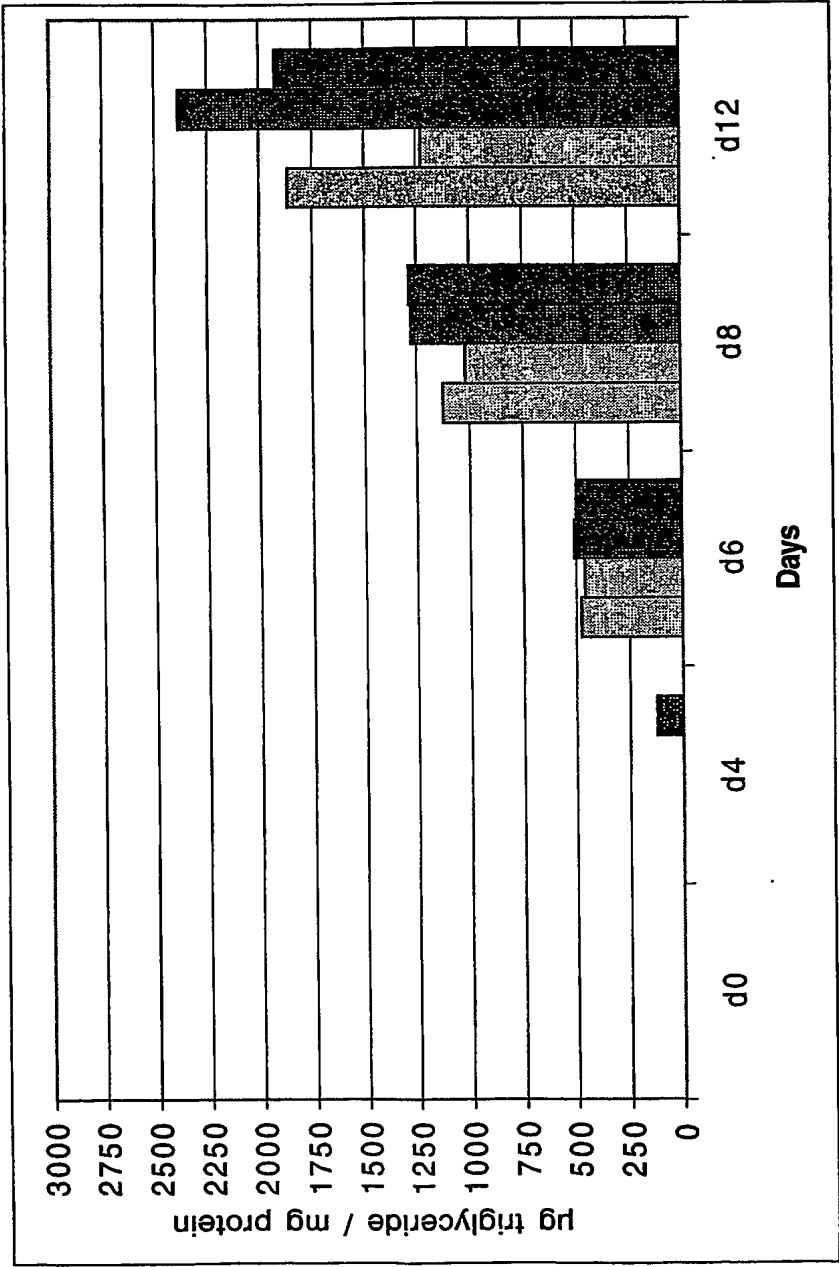


Figure 5. In vitro assays for determination of triglyceride storage and glycogen levels in adipocytes overexpressing Prl-1

Figure 5A. Up-regulation of cellular triglyceride levels in cells overexpressing Prl-1



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Figure 5B. Up-regulation of cellular glycogen levels in cells overexpressing Prl-1

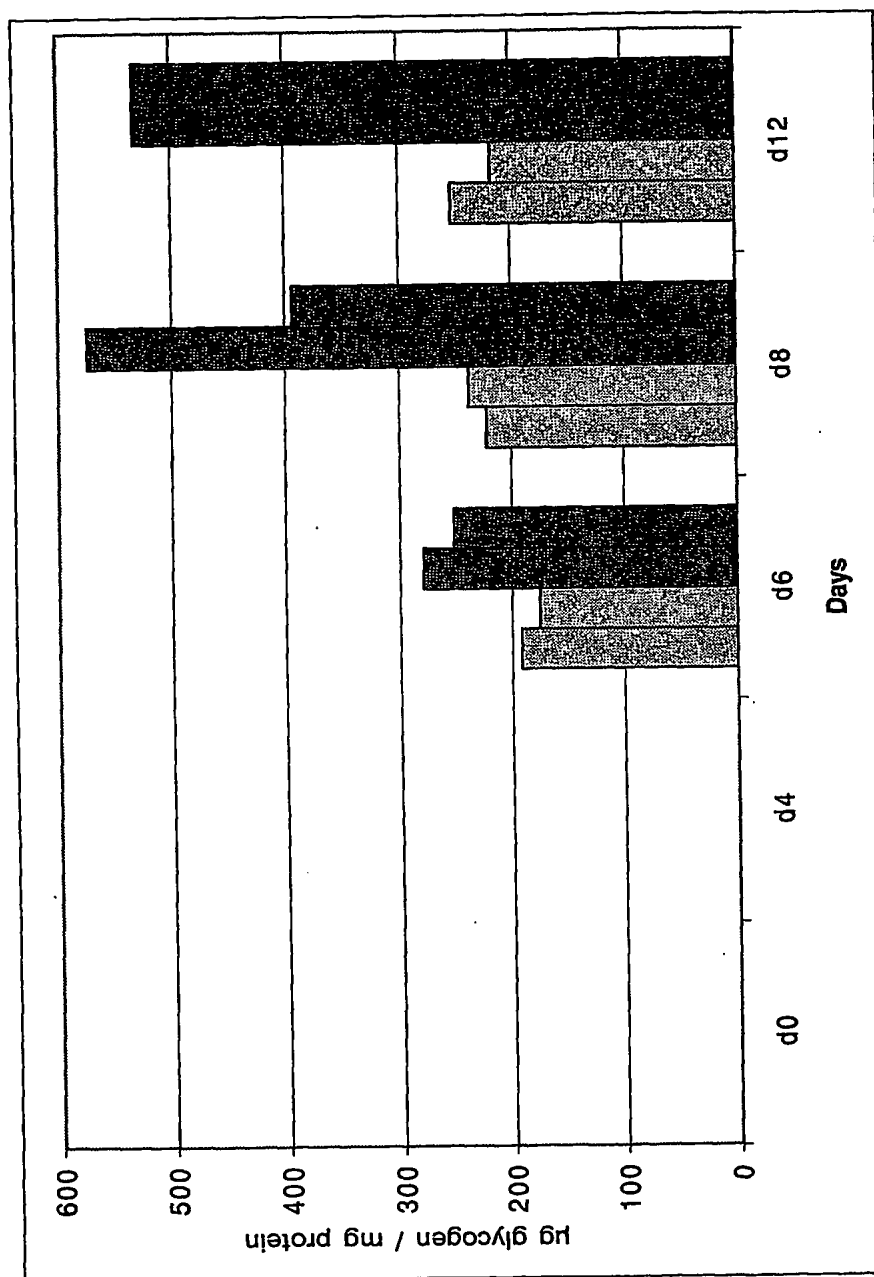


Figure 6. In vitro assays for determination of lipid synthesis and esterification of free fatty acids in Prl-1 loss of function (LOF) adipocytes

Figure 6A. Lipid synthesis levels on day 6 of differentiation in Prl-1 LOF 3T3-L1 cells

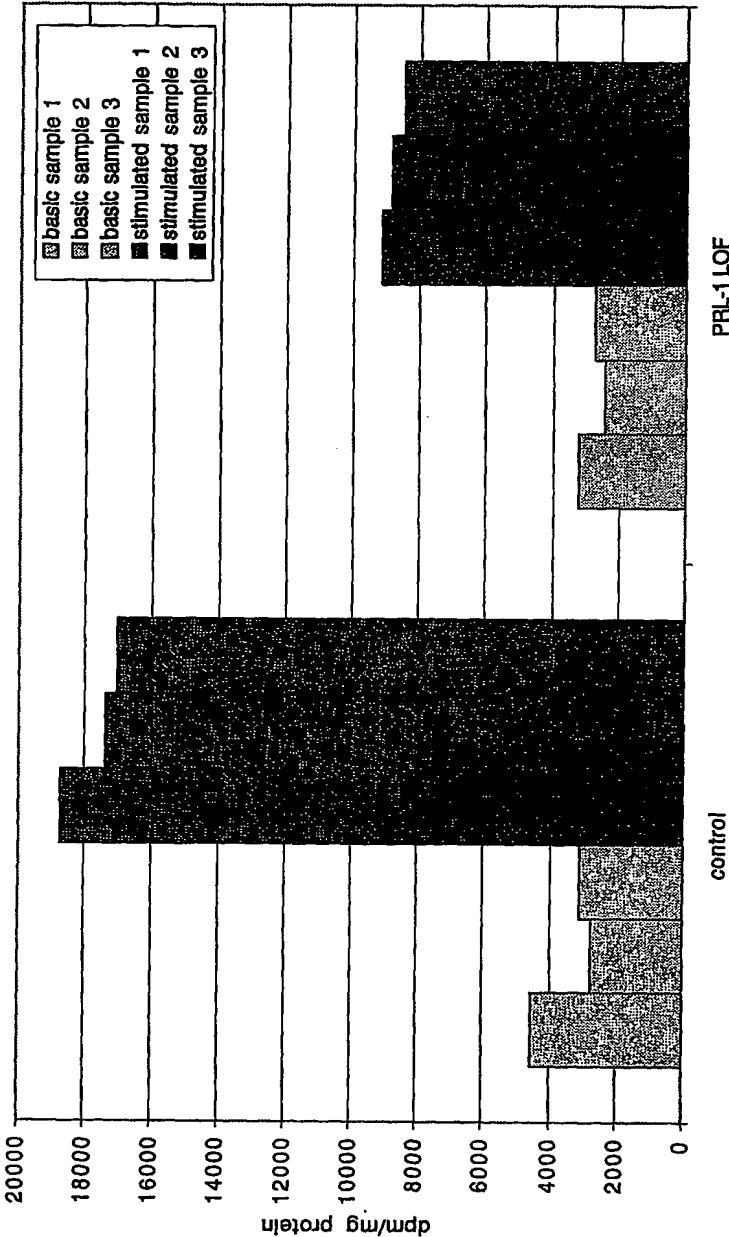
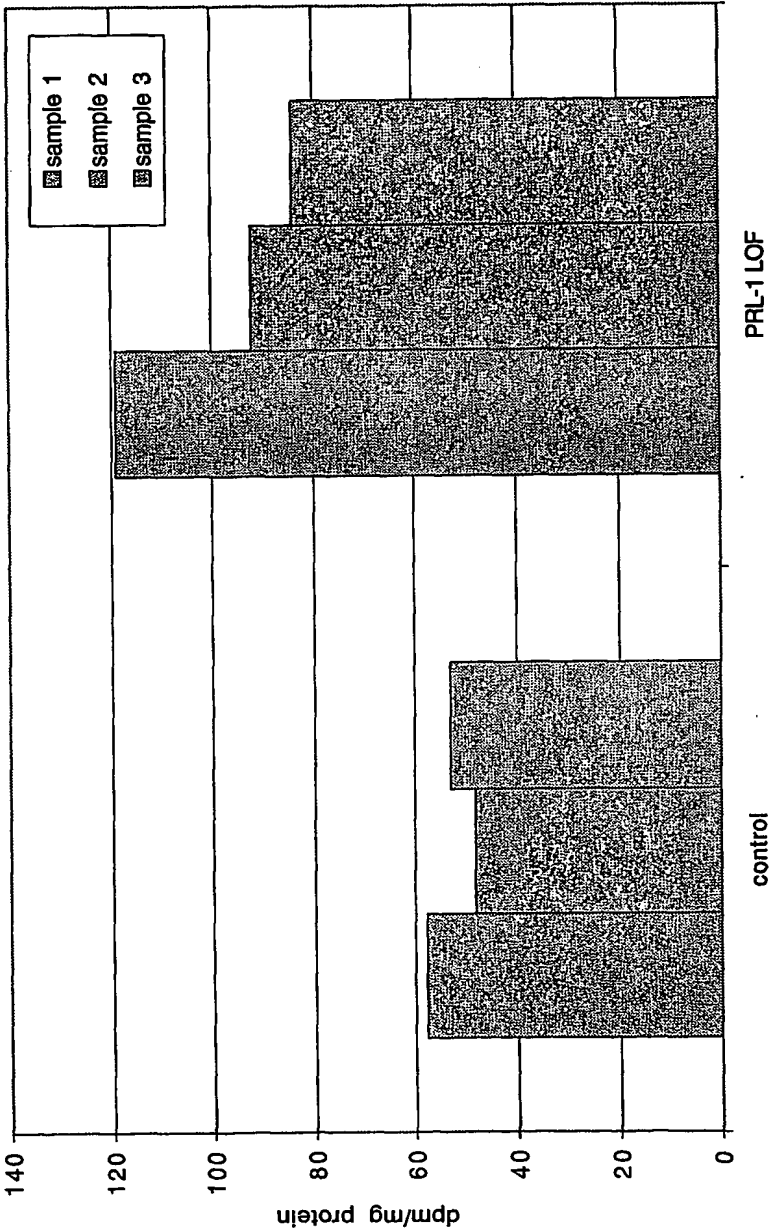


Figure 6B. Fatty acid esterification levels after free fatty acid uptake on day 12 of differentiation in Prl-1 LOF 3T3-L1 cells



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Figure 7. Expression of human *PRL-1* homologs in mammalian (human) tissue

Figure 7A. Microarray analysis of *PRL-1* expression in abdominal derived primary adipocyte cells during the differentiation from preadipocytes to mature adipocytes

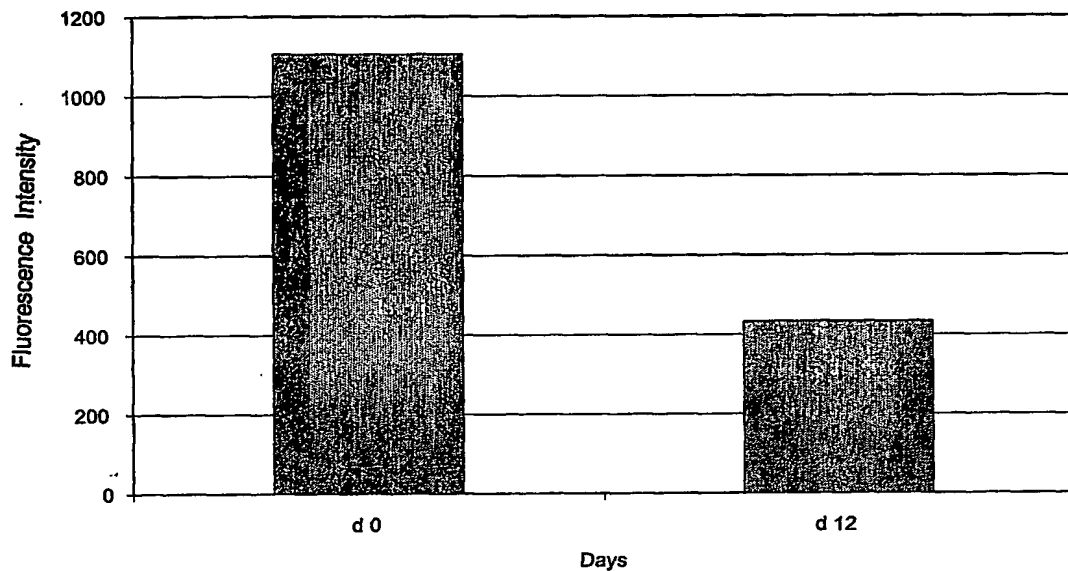
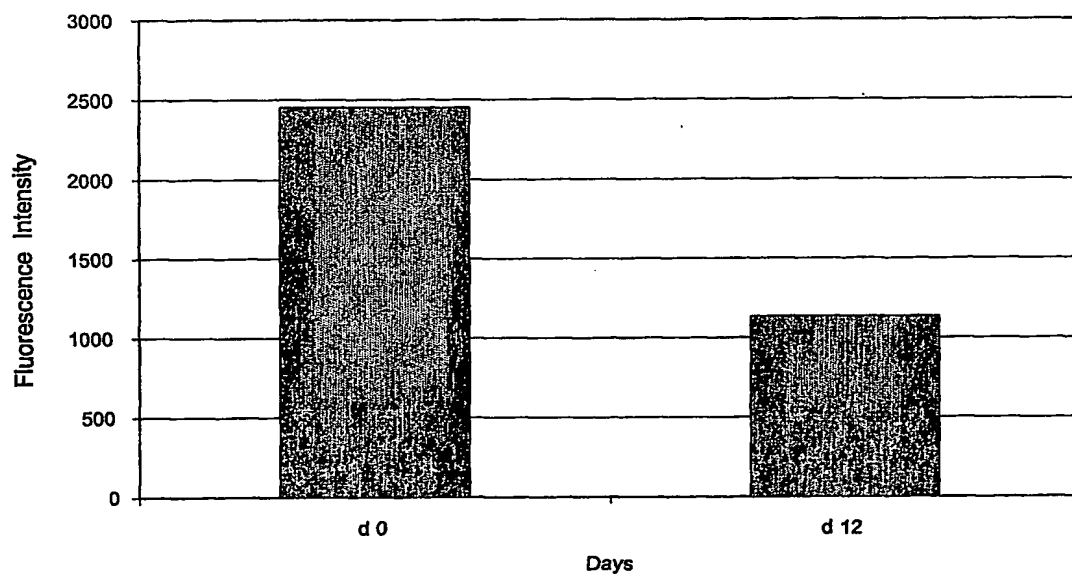


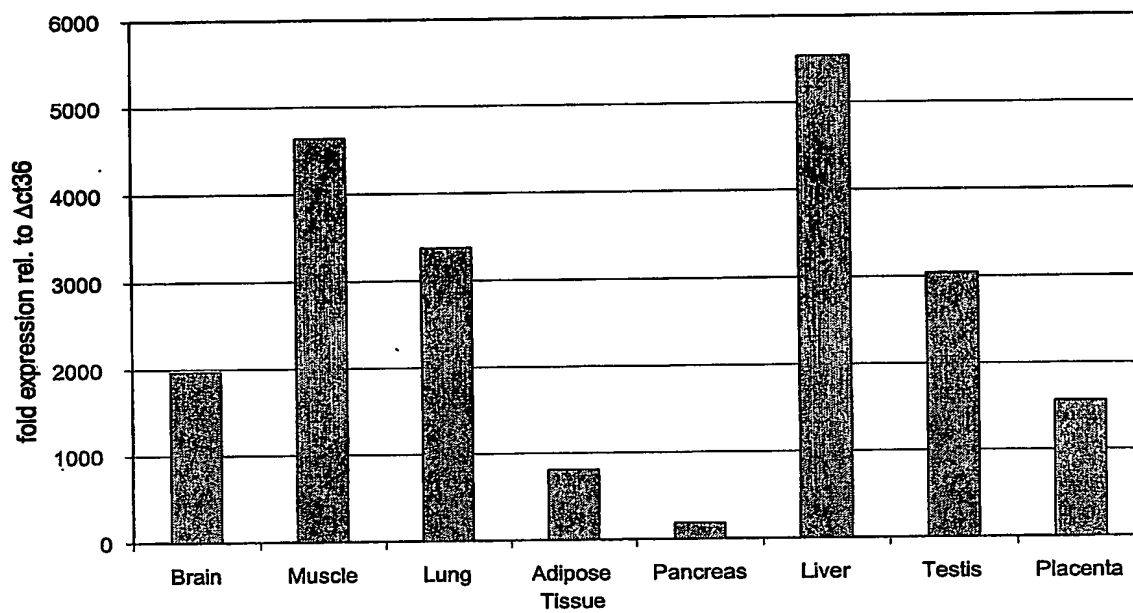
Figure 7B. Microarray analysis of *PRL-1* expression in a human adipocyte cell line during the differentiation from preadipocytes to mature adipocytes



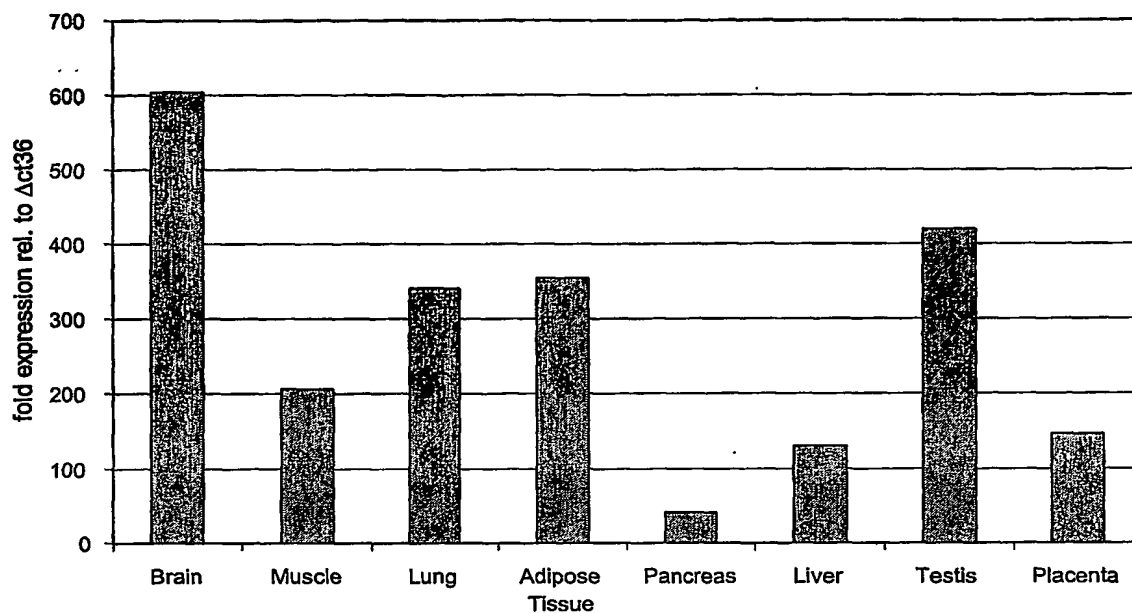
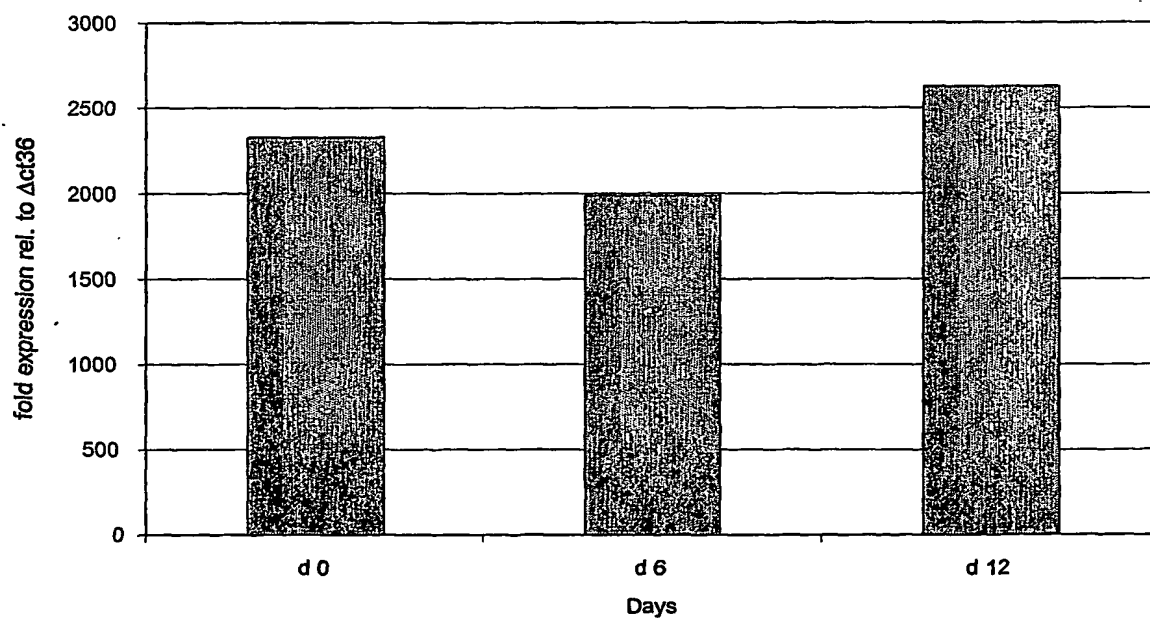
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Figure 8. Real-time PCR analysis of the expression of *PRL-1* homologs in different human tissues

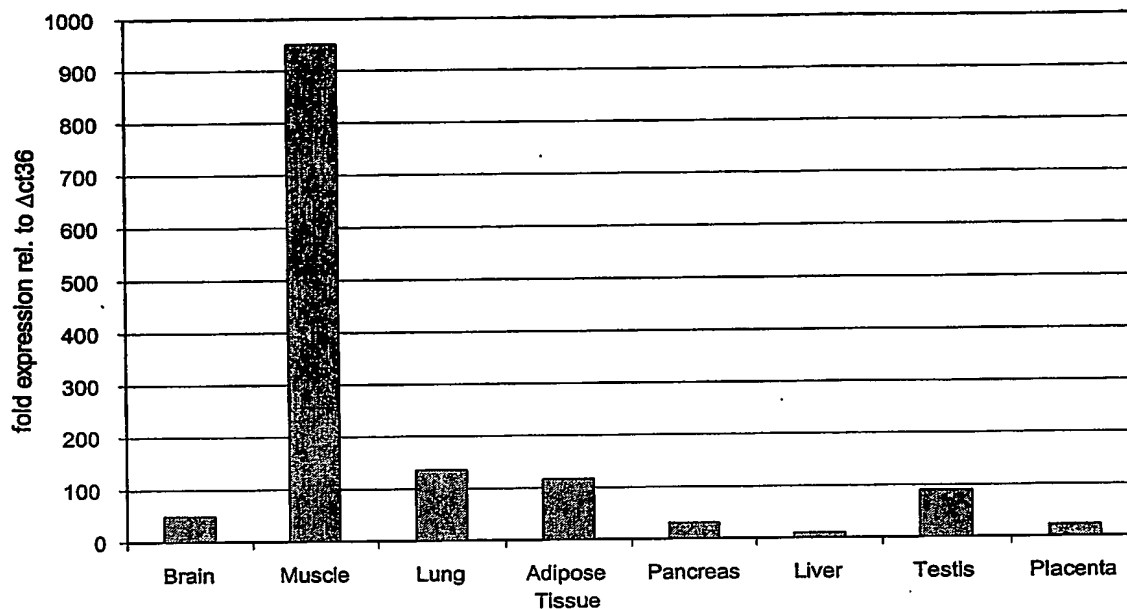
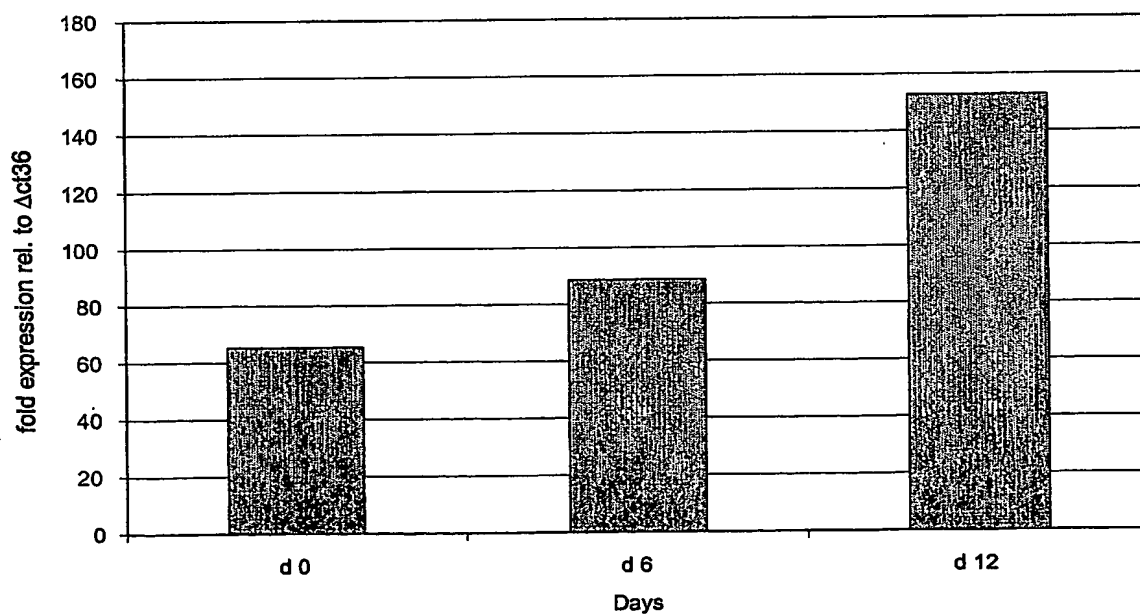
Figure 8A. Real-time PCR analysis of PRL-1 expression in different human tissues



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Figure 8B. Real-time PCR analysis of PRL-2 expression in different human tissues**Figure 8C. Real-time PCR analysis of PRL-2 expression in human primary adipocytes during preadipocyte differentiation**

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Figure 8D. Real-time PCR analysis of PRL-3 expression in different human tissues**Figure 8E. Real-time PCR analysis of PRL-3 expression in human primary adipocytes during preadipocyte differentiation**

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Figure 9. In vitro assays for determination of free fatty acid and glucose uptake by adipocytes overexpressing Prl-1

Figure 9A. Up-regulation of free fatty acid uptake in SGBS cells overexpressing Prl-1

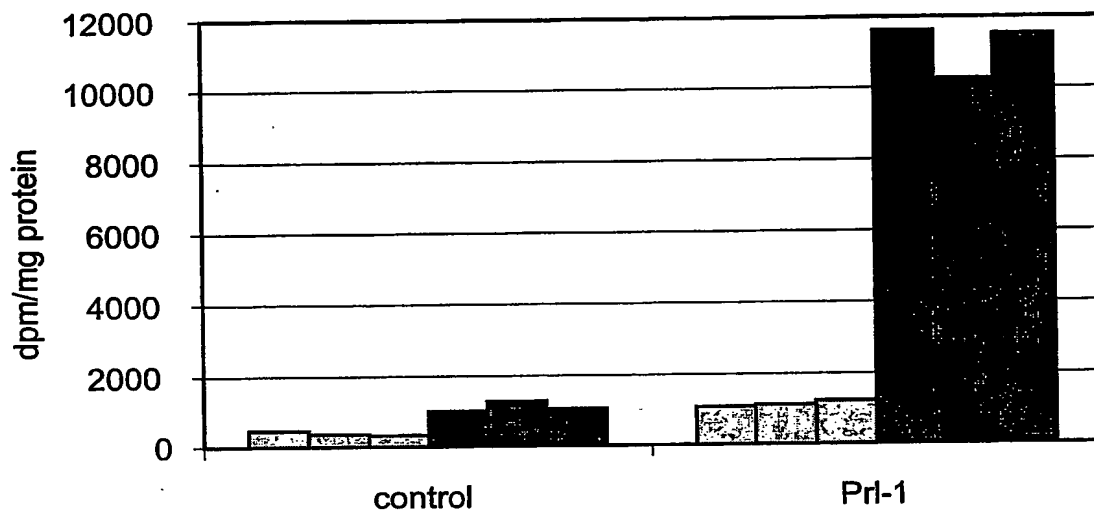


Figure 9B. Up-regulation of glucose uptake in SGBS cells overexpressing Prl-1

